REMARKS

The Office Action mailed February 24, 2003 has been carefully reviewed and the foregoing amendment has been made in consequence thereof. A Submission of Marked Up Claims is submitted herewith.

Claims 1-4, 6-9, 15-31, 37 and 38 are pending in this application. Claims 1-4, 6-9, 15-31, 37 and 38 stand rejected.

The rejection of Claims 1-4, 23-26, 37 and 38 under 35 U.S.C. § 103(a) as being unpatentable over Conklin et al. (U.S. Patent 3,358,148) in view of Taylor et al. (U.S. Patent 5,828,458) is respectfully traversed.

Conklin et al. describe a haze measuring apparatus that includes a light source (1) rigidly mounted in a metal block (4), and an orifice (5) that allows light to pass from the source to transparent sample tube (6). Diametrically opposed to orifice (5) is an orifice (8) which allows light to pass from the sample tube to a transmittance photocell (9). An orifice (11) is located at a fixed angle from orifice (8) and allows light to pass from the sample tube through a lens (12) to a scatter photocell (13). Conklin et al. also describe that the haze measuring apparatus includes a hinge (4b) and a clasp (4c) whereby a discrete section (4) (sic) can be moved with respect to a discrete section (4a), and that the invention can be used to measure a plurality of small samples or that the sample tube can be an integral part of a plant process stream and continuous measurement of such a stream would be possible. Conklin et al. further describe that the haze measuring apparatus includes a meter (21) or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze.

Taylor et al. describe a turbidity sensor (10) that senses the turbidity of a fluid flowing along a flow path (12), from a fluid source (14) to an outlet (16). A test cell (18) along the flow path includes an LED (21), and at least one detector (22), preferably including at least one photodiode. The detector includes photodiodes (24) and (32) for sensing light at positions separated from the source LED. Taylor et al. also describe that one type of monitoring process analyzes signal changes in the outputs from the photodiodes which may be used to generate a failure indication, a warning light, or an audible alarm.

It is asserted within the Office Action that "Conklin and Taylor disclose everything ...with the exception of inputting a control structure into the circuitry." (Page 6, para. 4). Applicants agree that Conklin et al. and Taylor et al describe inputting a control structure into the circuitry. For this reason alone, Applicants respectfully submit the presently pending claims are patentably distinguishable from the cited combination. Moreover, since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 1-4, 23-26, 37 and 38 be withdrawn.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Conklin et al. according to the teachings of Taylor et al. More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01.

Moreover, the Federal Circuit has determined that:

> [I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible . . . to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants'

disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

In addition, Applicants respectfully submit that no motivation for the combination can be found within Conklin et al. and Taylor et al., as Conklin et al. and Taylor et al. teach away from each other. Conklin et al. describe a haze measuring apparatus that includes a light source rigidly mounted in a metal block, and an orifice that allows light to pass from the source through a transparent sample tube to a scatter photocell. Conklin et al. also describe that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze. Specifically, Conklin et al. do not describe nor suggest circuitry coupled to said first and second photodiodes to monitor the ratio of light intensities measured by said first and second photodiode to indicate the presence of particulate within an introduced fuel flow, and "a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities."

In contrast, Taylor et al. describes that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm." Moreover, in contrast to Conklin et al., at column 1 lines 29-35, Taylor recites that "A problem identified in prior art turbidity sensors is that the light source that shines light into the fluid sample can change emission characteristics with time or with variations in temperature. Similarly, changes in operating characteristics can take place in the sensors that are used to sense the light that travels through the fluid."

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, considered as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Taylor et al. teaches away from Conklin et al., and as such, there is no suggestion or motivation to combine Conklin et al. with Taylor et al..

Further, and to the extent understood, no combination of Conklin et al. and Taylor et al., describes or suggests the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 1 recites an in-line particulate detector that includes "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion; a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiodes to monitor the ratio of light intensities measured by said first and second photodiode to indicate the presence of particulate within an introduced fuel flow; and a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities."

Neither Conklin et al. nor Taylor et al., considered alone or in combination, describe or suggest an in-line particulate detector that includes a housing having an inner flow portion, in which the housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through the inner flow portion to a fuel consumer, a laser diode light source disposed within the housing, a first photodiode disposed within the housing, a second photodiode disposed within the housing adjacent the first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode, circuitry coupled to the first and second photodiodes to monitor the ratio of light intensities measured by the first and second photodiode to indicate the presence of particulate within an introduced fuel flow, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, neither Conklin et al. nor Taylor et al. describe or suggest an in-line particulate detector that includes a laser diode light source disposed within the housing. Additionally, the combination of Conklin et al. and Taylor et al. does not

describe or suggest a control structure inputted into a circuitry to initiate a system control based on the ratio of light intensities. Rather, Conklin et al. describe that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claims 2-4 depend directly from independent Claim 1. When the recitations of Claims 2-4 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-4 likewise are patentable over Conklin et al. in view of Taylor et al.

Claim 23 recites an in-line particulate detector including "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a means for emitting a light beam within said inner flow portion; a first means for detecting substantially full strength of an unimpeded light beam generated by said means for emitting; a second means offset from a normal unimpeded path between said light emitting means and said first means for detecting a baseline level of unimpeded light beam generated by said means for emitting; a means for comparing the light intensities detected by said first and second means for detecting, to determine the presence of particulate within an introduced flow; and a control means for receiving from said comparing means a signal to initiate a system control based on the ratio of light intensities."

Neither Conklin et al. nor Taylor et al, considered alone or in combination, describe or suggest an in-line particulate detector including a housing having an inner flow portion, in which the housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer, a means for comparing the light intensities detected by a first and second means for detecting, to determine the presence of particulate within an introduced flow, and a control means for receiving from the comparing means a signal to initiate a system control. Moreover, neither Conklin et al. nor Taylor et al. describe "a control means for receiving from the comparing means a signal to initiate a system control based on the ratio of light intensities." Rather, Conklin et al. describe that the apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm. For at least the reasons set forth above, Claim 23 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claims 24-26 depend directly from independent Claim 23. When the recitations of Claims 24-26 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claims 24-26 likewise are patentable over Conklin et al. in view of Taylor et al.

Claim 37 recites an in-line particulate detector including "a housing having an inner flow portion; which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion; a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode disposed within said housing adjacent said first photodiode positioned such that a baseline level of an unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities."

Neither Conklin et al. nor Taylor et al., considered alone or in combination, describe or suggest an in-line particulate detector including a laser diode light source, a first photodiode, a second photodiode offset from a normal unimpeded path between the laser diode and the first photodiode, circuitry coupled to the first and second photodiode to monitor the ratio of light intensities measured by the first and second photodiodes, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, neither Conklin et al. nor Taylor et al. describe an in-line particulate detector including a laser diode light source, and "circuitry coupled to the first and second photodiode to monitor the ratio of light intensities, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities" Rather, Conklin et al. describe that the apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm. For at least the reasons set forth above, Claim 37 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claim 38 recites an in-line particulate detector for insertion within a pipeline, wherein the detector includes "a laser diode light source to be disposed within said pipeline for

emitting a light beam within an inner flow portion of said pipeline; a first photodiode to be disposed within said pipeline positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode to be disposed within said pipeline adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities."

Neither Conklin et al. nor Taylor et al., considered alone or in combination, describe or suggest an in-line particulate detector including a Laser diode light source, a first photodiode, a second photodiode, circuitry coupled to the first and second photodiode to monitor the ratio of light intensities measured by the first and second photodiodes, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, neither Conklin et al. nor Taylor et al. describe a laser diode light source, and "circuitry coupled to the first and second photodiode to monitor the ratio of light intensities, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities." Rather, Conklin et al. describe that the apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in

view of Taylor et al. For at least the reasons set forth above, Claim 38 is submitted to be patentable over Conklin et al. in view of Taylor et al.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 1-4, 23-26, 37 and 38 be withdrawn.

The rejection of Claims 6-9 and 27-31 under 35 U.S.C. § 103(a) as being unpatentable over Conklin et al. (U.S. Patent 3,358,148) and Taylor et al. (U.S. Patent 5,828,458) in view of Infante (U.S. Patent 5,742,064) is respectfully traversed.

Conklin et al. and Taylor et al. are described above. Infante describes an optical detection system that includes a probe (5) connected to a pipe (10) in a slip stream configuration such that fluid (15) from the pipe is routed through the probe located outside the pipe. An optical waveguide is connected on one end to the probe and on the other end to an analyzer device (25) such as a spectrometer (35) for analyzing the wavelength of light through the waveguide. A computer is electrically coupled to the spectrometer to process the data received from the spectrometer and determine the amounts and types of impurities contained in the petroleum.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Conklin et al. and Taylor et al. according to the teachings of Infante. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from several patents in an attempt to arrive at the claimed invention. Specifically, Conklin et al. is cited for its teaching that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, Taylor et al. is cited for its teaching that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm, and Infante is cited for its teaching that a computer, electrically coupled to a spectrometer, can process data received from the spectrometer and determine the amounts and types of impurities contained

in petroleum. Since there is no teaching or suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants respectfully request that the Section 103 rejection be withdrawn.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Applicants respectfully submit however, that a closer examination of the prior art would reveal that the prior art teaches away from the present invention. More specifically, none of Conklin et al., Taylor et al., and Infante, considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claims 6-9 depend, either directly or indirectly, from independent Claim 1 which recites an in-line particulate detector that includes "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion; a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiodes to monitor the ratio of light intensities measured by said first and second photodiode to indicate the presence of

particulate within an introduced fuel flow; and a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities."

None of Conklin et al., Taylor et al., and Infante, alone or in combination, describe or suggest an in-line particulate detector that includes a housing having an inner flow portion, in which the housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through the inner flow portion to a fuel consumer, a laser diode light source disposed within the housing, a first photodiode disposed within the housing, a second photodiode disposed within the housing adjacent the first photodiode and offset from a normal unimpeded path between the laser diode and the first photodiode, circuitry coupled to the first and second photodiode to monitor the ratio of light intensities measured by the first and second photodiode to indicate the presence of particulate within an introduced fuel flow, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, none of Conklin et al., Taylor et al., and Infante considered alone or in combination, describe or suggest "a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities." Rather, Conklin et al. describe that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm, and Infante describes that a computer electrically coupled to a spectrometer can process data received from the spectrometer and determine the amounts and types of impurities contained in petroleum. For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. and Taylor et al. in view of Infante.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at

least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claims 6-9 depend, either directly or indirectly, from independent Claim 1. When the recitations of Claims 6-9 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 6-9 likewise are patentable over Conklin et al. and Taylor et al. in view of Infante.

Claims 27-31 depend, either directly or indirectly, from independent Claim 23 which recites an in-line particulate detector including "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a means for emitting a light beam within said inner flow portion; a first means for detecting substantially full strength of an unimpeded light beam generated by said means for emitting; a second means offset from a normal unimpeded path between said light emitting means and said first means for detecting a baseline level of unimpeded light beam generated by said means for emitting; a means for comparing the light intensities detected by said first and second means for detecting, to determine the presence of particulate within an introduced flow; and a control means for receiving from said comparing means a signal to initiate a system control based on the ratio of light intensities."

None of Conklin et al., Taylor et al, and Infante, alone or in combination, describe or suggest an in-line particulate detector that includes a housing having an inner flow portion, in which the housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer, a means for comparing the light intensities detected by a first and second means for detecting, to determine the presence of particulate within an introduced flow, and a control means for receiving from the comparing means a signal to initiate a system control. Moreover, none of Conklin et al., Taylor et al., and Infante considered alone or in combination, describe or suggest "a means for comparing the light intensities detected by a first and second means for detecting, to determine the presence of particulate within an introduced flow, and a control means for receiving from the comparing means a signal to initiate a system control." Rather, Conklin et

al. describe that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm, and Infante describes that a computer electrically coupled to a spectrometer can process data received from the spectrometer and determine the amounts and types of impurities contained in petroleum. For the reasons set forth above, Claim 23 is submitted to be patentable over Conklin et al. and Taylor et al. in view of Infante.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claims 27-31 depend, either directly or indirectly, from independent Claim 23. When the recitations of Claims 27-31 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claims 27-31 likewise are patentable over Conklin et al. and Taylor et al. in view of Infante.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 5-9 and 27-31 be withdrawn.

The rejection of Claims 15 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Conklin et al. (U.S. Patent 3,358,148) in view of Tanaka et al. (U.S. Patent 4,270,049) and further in view of Taylor et al. (U.S. Patent 5,828,458) is respectfully traversed.

Conklin et al. and Taylor et al. are described above. Tanaka et al. describe a liquid leakage detection system that includes an oil detector cable (14) including a light guide (10') that is formed using a plurality of fiber optics each of which includes a light guide core (10)

and a cladding (11) which is stranded or otherwise assembled and coated with a sheath (13) which serves to absorb oil. Tanaka et al. also describe a wireless transmission line in communication with a centralized monitor station wherein the incoming signal is applied to a comparator (21) and used to generate visual and audio alarms.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Conklin et al. according to the teachings of Tanaka et al. and Taylor et al. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from several patents in an attempt to arrive at the claimed invention. Specifically, Conklin et al. is cited for its teaching that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, Tanaka et al. is cited for its teaching that a liquid leakage detection system includes an oil detector cable, formed using a plurality of fiber optics, can generate a signal, and a wireless transmission line connected to a centralized monitor station wherein the incoming signal is used to generate visual and audio alarms, and Taylor et al. is cited for its teaching that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm. Since there is no teaching or suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants respectfully request that the Section 103 rejection be withdrawn.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991).

In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Applicants respectfully submit however, that a closer examination of the prior art would reveal that the prior art teaches away from the present invention. More specifically, none of Conklin et al., Tanaka et al., and Taylor et al., considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 15 recites an in-line particulate detector including "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion; a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced fuel flow; a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities; at least one remote unit for transmitting signals generated from said first and second photodiodes; a central station; and a communications link."

None of Conklin et al., Tanaka et al., and Taylor et al., considered alone or in combination, describe or suggest an in-line particulate detector including a laser diode light source, a first photodiode, a second photodiode, circuitry coupled to the first and second photodiode to monitor the ratio of light intensities measured by the first and second photodiodes, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, none of Conklin et al., Tanaka et al., and Taylor et al., considered alone or in combination, describe or suggest "a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities." Rather, Conklin et al. describe that an apparatus output can be observed on a meter or can be

adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, Tanaka et al. describe that a liquid leakage detection system that includes an oil detector cable that is formed using a plurality of fiber optics can generate a signal, and a wireless transmission line connected to a centralized monitor station wherein the incoming signal is used to generate visual and audio alarm, and Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm. For at least the reasons set forth above, Claim 15 is submitted to be patentable over Conklin et al. in view of Tanaka et al. and further in view of Taylor et al.

Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claim 16 depends directly from independent Claim 15. When the recitations of Claim 16 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claim 16 likewise is patentable over Conklin et al. in view of Tanaka et al. and further in view of Taylor et al.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 15-16 be withdrawn.

The rejection of Claims 17-22 under 35 U.S.C. § 103(a) as being unpatentable over Conklin et al. (U.S. Patent 3,358,148), Tanaka et al. (U.S. Patent 4,270,049), and Taylor et al. (U.S. Patent 5,828,458) and further in view of Lamensdorf (U.S. Patent 5,568,121) is respectfully traversed.

Conklin et al., Tanaka et al., and Taylor et al., are described above. Lamensdorf describes a main monitoring station (10) that communicates with a plurality of remote attendants (12) through a conventional interface or modem (14) and a base station radio (16) through an antenna (18). Lamensdorf also describes that a gas detection interface (30) may be provided at the portable attendant (12) to detect and measure the level of selected gases at the remote site. Where the presence or absence of specific gases is hazardous, an alarm is sounded at both the portable attendant and the main monitoring center.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Conklin et al. according to the teachings of Tanaka et al., Taylor et al., and Lamensdorf. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from several patents in an attempt to arrive at the claimed invention. Specifically, Conklin et al. is cited for its teaching that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Tanaka et al. is cited for its teaching that a liquid leakage detection system that includes an oil detector cable that is formed using a plurality of fiber optics can generate a signal, and a wireless transmission line connected to a centralized monitor station wherein the incoming signal is used to generate visual and audio alarms. Taylor et al. is cited for its teaching that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm, and Lamensdorf is cited for its teaching that a main monitoring station communicates with a plurality of remote attendants through a conventional interface or modem and a base station radio through an antenna and when the presence or absence of specific gases is hazardous, an alarm is sounded at both the portable attendant and the main monitoring center.

Since there is no teaching or suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of

course, such a combination is impermissible, and for this reason alone, Applicants respectfully request that the Section 103 rejection be withdrawn.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Applicants respectfully submit however, that a closer examination of the prior art would reveal that the prior art teaches away from the present invention. More specifically, none of Conklin et al., Tanaka et al., Taylor et al., and Lamensdorf, considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claims 17-22 depend, either directly or indirectly, from independent Claim 15 which recites an in-line particulate detector including "a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer; a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion; a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode; a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode; circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced fuel flow; a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities; at least one remote unit for transmitting signals generated from said first and second photodiodes; a central station; and a communications link."

None of Conklin et al., Tanaka et al., Taylor et al., and Lamensdorf, alone or in combination, describe or suggest an in-line particulate detector including a laser diode light source, a first photodiode, a second photodiode, circuitry coupled to the first and second photodiode to monitor the ratio of light intensities measured by the first and second photodiodes, and a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities. Moreover, none of Conklin et al., Tanaka et al., Taylor et al., and Lamensdorf, considered alone or in combination, describe or suggest "a control structure inputted into the circuitry to initiate a system control based on the ratio of light intensities." Rather, Conklin et al. describe that an apparatus output can be observed on a meter or can be adapted to actuate either indicating or recording instruments of the electromechanical type to provide a visual measure of the relative severity of haze, and Tanaka et al. describe that a liquid leakage detection system that includes an oil detector cable that is formed using a plurality of fiber optics can generate a signal, and a wireless transmission line connected to a centralized monitor station wherein the incoming signal is used to generate visual and audio alarm. Taylor et al. describe that signal changes in the outputs from the photodiodes may be used to generate a failure indication, a warning light, or an audible alarm, and Lamensdorf describe that a main monitoring station communicates with a plurality of remote attendants through a conventional interface or modem and a base station radio through an antenna and when the presence or absence of specific gases is hazardous, an alarm is sounded at both the portable attendant and the main monitoring center.

For at least the reasons set forth above, Claim 15 is submitted to be patentable over Conklin et al., Tanaka et al., and Taylor et al., and further in view of Lamensdorf.

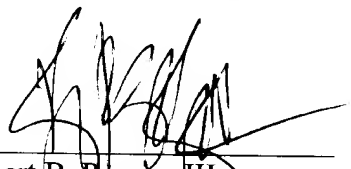
Furthermore, Applicants respectfully disagree with the assertion in the office action that one skilled in the art would understand an LED to be the functional equivalent of a laser diode. Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners. Verve LLC v. Crane Cams Inc., 65 USPQ2d 1051 (2002). Accordingly, Applicants respectfully submit that one skilled in the art would understand that an LED converts electric energy into electromagnetic radiation at a visible and near infrared frequencies, while in contrast, a laser diode operates with wavelengths below the red spectrum (<650 nm). For at least the reasons set forth above, Claim 1 is submitted to be patentable over Conklin et al. in view of Taylor et al.

Claims 17-22 depend, either directly or indirectly, from independent Claim 15. When the recitations of Claims 17-22 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 17-22 likewise are patentable over Conklin et al., Tanaka et al., and Taylor et al., and further in view of Lamensdorf.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 17-22 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



Robert B. Reeser, III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Anthony Dean, et al.

Serial No.: 09/333,181

Filed: June 14, 1999

For: IN-LINE PARTICULATE DETECTOR

Art Unit: 2877

Examiner: Smith, Zandra V.

SUBMISSION OF MARKED UP CLAIMS

Commissioner for Patents
Box AF
Washington, D.C. 20231

Sir:

Submitted herewith are marked up claims in accordance with 37 C.F.R. 1.121(c)(1)(ii), wherein additions are underlined and deletions are [bracketed].

IN THE CLAIMS:

1. (three times amended) An in-line particulate detector comprising:

a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode

[positioned] such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiodes to monitor the ratio of light intensities measured by said first and second photodiode to indicate the presence of particulate within an introduced fuel flow; and

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities.

15. (three times amended) An in-line particulate detector comprising:

a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode [positioned] such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced fuel flow;

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities; and

at least one remote unit for transmitting signals generated from said first and second photodiodes;

a central station; and

a communications link.

23. (three times amended) An in-line particulate detector comprising:

a housing having an inner flow portion, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a means for emitting a light beam within said inner flow portion;

a first means for detecting substantially full strength of an unimpeded light beam generated by said means for emitting;

a second means offset from a normal unimpeded path between said light emitting means and said first means for detecting a baseline level of unimpeded light beam generated by said means for emitting;

a means for comparing the light intensities detected by said first and second means for detecting, to determine the presence of particulate within an introduced flow; and

a control means for receiving from said comparing means a signal to initiate a system control based on the ratio of light intensities.

37. (three times amended) An in-line particulate detector comprising:

a housing having an inner flow portion; which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode [positioned] such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities.

38. (three times amended) An in-line particulate detector for insertion within a pipeline, said detector comprising:

a laser diode light source to be disposed within said pipeline for emitting a light beam within an inner flow portion of said pipeline;

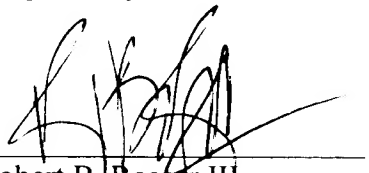
a first photodiode to be disposed within said pipeline positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode to be disposed within said pipeline adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode [positioned] such that a baseline level of unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities.

Respectfully Submitted,



Robert B. Reeser III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070